We claim:

1. A method of changing the gain of a receive path amplifier in a digital receiver that operates upon a received data packet containing a plurality of symbols, at least one of the symbols including encoding bits disposed therein and at least one subsequent data symbol encoded in a manner corresponding to the encoding bits of the symbol, the method comprising the steps of:

locating the one symbol;

decoding the encoding bits of the one symbol;

setting the gain of the receive path amplifier to correspond to an appropriate gain that is determined in part based upon the encoding bits; and

amplifying the at least one subsequent data symbol with the appropriate gain.

2. The method according to claim 1 wherein:

the one symbol and at least one subsequent data symbol are separated by only a single guard interval; and

the step of setting the gain takes place prior to amplifying the at least one subsequent data symbol.

3. The method according to claim 1 wherein the step of decoding decodes only the encoding bits within the one symbol.

4. The method according to claim 1 wherein the step of locating the one symbol comprises the steps of:

searching for an endpoint of a cyclic pattern of training symbols within the received data packet which precede the one symbol; and

waiting a predetermined period of time after the endpoint.

5. The method according to claim 1 wherein the step of decoding includes the steps of:

sampling a portion of the one symbol corresponding to the encoded bits; and

performing a discrete Fourier transform on the encoded bits.

6. The method according to claim 1 further including the steps of decoding the at least one subsequent data symbol using a fast Fourier transform and a Viterbi decoding process.

7. The method according to claim 1 further including, prior to the step of locating the one symbol, the step of setting an initial gain based upon at least one power estimation algorithm applied to a plurality of training symbols within the packet which precede the one symbol.

8. The method according to claim 1 wherein the encoding bits provide data rate information.

9. The method according to claim 1 wherein the encoding bits data provide modulation type information.

10. The method according to claim 1 wherein the encoding bits provide data rate information and modulation type information.

11. The method according to claim 1 wherein there are a plurality of other symbols and a plurality of corresponding guard intervals between the one symbol and the subsequent data symbol.

12. The method according to claim 1 wherein data symbols that are subsequent to the at least one subsequent data symbol and which are part of the same packet are amplified with the appropriate gain.

13. The method according to claim 1 wherein the step of decoding decodes less than all bits that make up the one symbol.

14. The method according to claim 13 wherein:

the one symbol and at least one subsequent data symbol are separated by only a single guard interval; and

the step of setting the gain takes place prior to amplifying the at least one subsequent data symbol.

15. The method according to claim 1 wherein the step of decoding is performed on multi-carrier modulated BPSK encoded bits and the step of decoding includes the steps of

sampling the multi-carrier modulated BPSK encoded bits;

performing a discrete Fourier transform on the BPSK encoded bits to obtain transformed encoded bits;

determining the phase of the BPSK encoded bits based upon the transformed encoded bits; and

identifying the encoding of the subsequent data signal based upon the determined phase of the BPSK encoded bits.

16. The method according to claim 15 wherein the step of identifying is implemented using a lookup table populated with maximum likelihood values.

17. The method according to claim 15 further including the steps of decoding the at least one subsequent data symbol using a fast Fourier transform and a Viterbi decoding process.

18. The method according to claim 15 wherein the step of performing the discrete Fourier transform performs the discrete Fourier transform on only the encoded bits.

19. The method according to claim 18 wherein the encoded bits, when received at the receiver, are spread at non-adjacent frequency bins.

20. The method according to claim 15 wherein the step of decoding further includes, prior to the step of determining the phase, the steps of:

normalizing and channel correcting the transformed encoded bits to obtain normalized and channel corrected transformed encoded bits; and

wherein the step of determining the phase of the BPSK encoded bits is based upon the normalized and channel corrected transformed encoded bits.

21. The method according to claim 20 further including the steps of decoding the at least one subsequent data symbol using a fast Fourier transform and a Viterbi decoding process.

22. The method according to claim 1 wherein:

the one symbol and at least one subsequent data symbol are separated by a guard interval; and

the step of setting the gain takes place during the guard interval.

23. The method according to claim 22 wherein the step of decoding decodes less than all bits that make up the one symbol.

24. The method according to claim 23 wherein the step of decoding decodes only the encoding bits within the one symbol.

25. The method according to claim 23 wherein the step of locating the one symbol comprises the steps of:

searching for an endpoint of a cyclic pattern of training symbols within the received data packet which precede the one symbol; and

waiting a predetermined period of time after the endpoint.

26. The method according to claim 23 wherein the step of decoding includes the steps of:

sampling a portion of the one symbol corresponding to the encoded bits; and

performing a discrete Fourier transform on the encoded bits.

27. The method according to claim 23 further including the steps of decoding the at least one subsequent data symbol using a fast Fourier transform and a Viterbi decoding process.

28. The method according to claim 23 further including, prior to the step of locating the one symbol, the step of setting an initial gain based upon at least one power estimation algorithm applied to a plurality of training symbols within the packet which precede the one symbol.

29. The method according to claim 23 wherein the encoding bits provide data rate information.

30. The method according to claim 23 wherein the encoding bits data provide modulation type information.

31. The method according to claim 23 wherein the encoding bits provide data rate information and modulation type information.

32. The method according to claim 23 wherein the step of decoding is performed on multi-carrier modulated BPSK encoded bits and the step of decoding includes the steps of

sampling the multi-carrier modulated BPSK encoded bits;

performing a discrete Fourier transform on the BPSK encoded bits to obtain transformed encoded bits;

determining the phase of the BPSK encoded bits based upon the transformed encoded bits; and

identifying the encoding of the subsequent data signal based upon the determined phase of the BPSK encoded bits.

33. The method according to claim 32 wherein the step of identifying is implemented using a lookup table populated with maximum likelihood values.

34. The method according to claim 32 further including the steps of decoding the at least one subsequent data symbol using a fast Fourier transform and a Viterbi decoding process.

35. The method according to claim 32 wherein the step of performing the discrete Fourier transform performs the discrete Fourier transform on only the encoded bits.

36. The method according to claim 35 wherein the encoded bits, when received at the receiver, are spread at non-adjacent frequency bins.

37. The method according to claim 32 wherein the step of decoding further includes, prior to the step of determining the phase, the steps of:

normalizing and channel correcting the transformed encoded bits to obtain normalized and channel corrected transformed encoded bits; and

wherein the step of determining the phase of the BPSK encoded bits is based upon the normalized and channel corrected transformed encoded bits.

38. The method according to claim 37 further including the steps of decoding the at least one subsequent data symbol using a fast Fourier transform and a Viterbi decoding process.

39. A method of changing the gain of a receive path amplifier that operates upon a received data packet containing a plurality of symbols, at least one symbol having a first type of encoding and including encoding bits identifying one of a plurality of second type of encodings and at least one subsequent data symbol encoded in a manner corresponding to the one identified second type of encoding, the method comprising the steps of:

amplifying the received one symbol with a first gain corresponding to the first type of encoding using the receive path amplifier;

locating the amplified one symbol;

decoding the encoding bits of the one symbol to identify the one of the plurality of identified second type of encodings;

changing the gain of the receive path amplifier to a second gain corresponding to the one identified second type of encoding; and

amplifying the received at least one subsequent data symbol with the second gain using the receive path amplifier.

40. The method according to claim 39 wherein the first type of encoding is BPSK and the plurality of second types of encodings include different sizes of quadrature amplitude modulation constellations.

41. The method according to claim 39 wherein the first type of encoding is at a first data rate and the one of the plurality of identified second type of encodings is at a second data rate different from the first data rate.

42. The method according to claim 41 wherein the second data rate is faster than the first data rate.

43. The method according to claim 39 wherein the step of changing the gain of the receive path amplifier occurs during a single guard interval that occurs between the at least one symbol and the at least one subsequent data symbol.

44. The method according to claim 43 wherein the first type of encoding is of a first modulation type and the second type of encoding is a second modulation type that is different from the first modulation type.

45. The method according to claim 43 wherein the first type of encoding is at a first data rate and the one of the plurality of identified second type of encodings is at a second data rate different from the first data rate.

46. The method according to claim 45 wherein the second data rate is faster than the first data rate.

47. The method according to claim 43 wherein the step of decoding decodes less than all bits that make up the one symbol.

48. The method according to claim 47 wherein the step of decoding decodes only the encoding bits within the one symbol.

49. The method according to claim 43 wherein the step of locating the one symbol comprises the steps of:

searching for an endpoint of a cyclic pattern of training symbols within the received data packet which precede the one symbol; and

waiting a predetermined period of time after the endpoint.

50. The method according to claim 43 wherein the step of decoding includes the steps of:

sampling a portion of the one symbol corresponding to the encoded bits; and

performing a discrete Fourier transform on the encoded bits.

51. The method according to claim 43 wherein the step of decoding is performed on multi-carrier modulated BPSK encoded bits and the step of decoding includes the steps of

sampling the multi-carrier modulated BPSK encoded bits;

performing a discrete Fourier transform on the BPSK encoded bits to obtain transformed encoded bits;

determining the phase of the BPSK encoded bits based upon the transformed encoded bits; and

identifying the encoding of the subsequent data signal based upon the determined phase of the BPSK encoded bits.

52. The method according to claim 51 wherein the step of identifying is implemented using a lookup table populated with maximum likelihood values.

53. The method according to claim 51 wherein the step of performing the discrete Fourier transform performs the discrete Fourier transform on only the encoded bits.

54. The method according to claim 53 wherein the encoded bits, when received at the receiver, are spread at non-adjacent frequency bins.

55. The method according to claim 51 wherein the step of decoding further includes, prior to the step of determining the phase, the steps of:

normalizing and channel correcting the transformed encoded bits to obtain normalized and equalized transformed encoded bits; and

wherein the step of determining the phase of the BPSK encoded bits is based upon the normalized and channel corrected transformed encoded bits.

56. The method according to claim 55 further including the steps of decoding the at least one subsequent data symbol using a fast Fourier transform and a Viterbi decoding process.

57. The method according to claim 39 further including the steps of decoding the at least one subsequent data symbol using a fast Fourier transform and a Viterbi decoding process.

58. The method according to claim 39 further including, prior to the step of locating the one symbol, the step of setting an initial gain based upon at least one power

estimation algorithm applied to a plurality of training symbols within the packet which precede the one symbol.

59. The method according to claim 39 wherein the encoding bits provide data rate information.

60. The method according to claim 39 wherein the encoding bits data provide modulation type information.

61. The method according to claim 39 wherein the encoding bits provide data rate information and modulation type information.

62. A receiver apparatus that receives a packet containing a plurality of symbols, at least one of the symbols including encoding bits disposed therein and at least one subsequent data symbol encoded in a manner corresponding to the encoding bits of the symbol, the receiver comprising:

a variable gain amplification circuit that amplifies each symbol in the packet with a determined gain;

a first decoder capable of decoding the encoding bits within the symbol;

a gain determination circuit which, based upon the decoded encoding bits, determines an appropriate gain for the at least one subsequent data symbol and causes the determined gain to be the appropriate gain for the at least one subsequent data symbol; and

a second decoder different from the first decoder that is capable of decoding the at least one subsequent data symbol.

63. The apparatus according to claim 62 wherein the first decoder is only capable of decoding the encoding bits within the symbol.

64. The apparatus according to claim 62 wherein the at least one symbol and the at least one subsequent data symbol are separated by only a single guard interval and wherein the gain determination circuit determines the appropriate gain during the single guard interval.

65. The apparatus according to claim 64 wherein both the first and second decoders receive timing signals from a symbol timing circuit.

66. The apparatus according to claim 64 wherein the first decoder includes a discrete Fourier transform circuit, a channel correction circuit, a slicing circuit and a table lookup decoding circuit.

67. The apparatus according to claim 66 wherein the second decoder includes a fast Fourier transform circuit, a channel estimation circuit, a demapping and deinterleaving circuit and a Viterbi decoder.

68. The apparatus according to claim 67 further including an amplitude tracking circuit that determines the magnitude of the received signal, which magnitude is used by the channel estimation circuit to scale the channel estimate for at least the at least one subsequent data symbol.

69. The apparatus according to claim 62 wherein the first decoder includes a discrete Fourier transform circuit, a channel correction circuit, a slicing circuit and a table lookup decoding circuit.

70. The apparatus according to claim 69 wherein the second decoder includes a fast Fourier transform circuit, a channel estimation circuit, a demapping and deinterleaving circuit and a Viterbi decoder.

71. The apparatus according to claim 70 further including an amplitude tracking circuit that determines the magnitude of the received signal, which magnitude is used by the channel estimation circuit to scale the channel estimate for at least the at least one subsequent data symbol.

72. A receiver apparatus that receives a packet containing a plurality of symbols, at least one of the symbols including encoding bits disposed therein and at least one subsequent data symbol encoded in a manner corresponding to the encoding bits of the symbol, the receiver comprising:

a variable gain amplifier that amplifies each symbol in the packet with a determined gain;

a decoder capable of decoding the encoding bits within the symbol prior to the arrival of the at least one subsequent data symbol and capable of decoding the at least one subsequent data symbol; and

a gain determination circuit which, based upon the decoded encoding bits, determines an appropriate gain for the at least one subsequent data symbol and causes the determined gain to be the appropriate gain for the at least one subsequent data symbol.

73. A receiver apparatus that receives a packet containing a plurality of symbols, at least one of the symbols including a symbol with encoding bits disposed therein and at least one subsequent data symbol encoded in a manner corresponding to the encoding bits of the symbol, the receiver comprising:

means for amplifying each symbol in the packet with a determined gain;

means for decoding the encoding bits within the symbol and the at least one subsequent data symbol;

means for determining an appropriate gain for the at least one subsequent data symbol; and

means for causing the determined gain to be the appropriate gain for the at least one subsequent data symbol.

74. The apparatus according to claim 73 wherein the means for decoding includes a first decoder for decoding the encoding bits and a second decoder for decoding the at least one subsequent data symbol.

75. The apparatus according to claim 74 wherein the at least one symbol and the at least one subsequent data symbol are separated by only a single guard interval and wherein the means for determining an appropriate gain determines the appropriate gain during the single guard interval.

76. The apparatus according to claim 73 wherein the means for decoding includes a decoder that decodes both the encoding bits and the at least one subsequent data symbol.

77. The apparatus according to claim 76 wherein the at least one symbol and the at least one subsequent data symbol are separated by only a single guard interval and wherein the means for determining an appropriate gain determines the appropriate gain during the single guard interval.

78. A method of adjusting the gain of a variable gain amplifier in a receive path of a receiver that is applied to a received packet containing a plurality of symbols, including a plurality of training symbols, a data identifying symbol, at least one subsequent data symbol, and a guard interval disposed between the data identifying symbol and the at least one subsequent data symbol, comprising the steps of:

determining an initial gain based upon training symbols;

determining an updated gain based upon decoding of at least a portion of the data identifying symbol; and

applying the updated gain to the variable gain amplifier prior to the end of the guard interval .

79. A method according to claim 78 wherein the guard interval is the only guard interval between the data identifying symbol and the at least one subsequent data symbol.

80. A method of decoding a portion of one symbol disposed within a packet containing a plurality of symbols more quickly than an entire symbol comprising the steps of:

locating the one symbol;

decoding the portion of the one symbol such that the decoding of the portion takes place within a first time period; and

decoding the entire symbol such that the decoding of the entire one symbol takes longer than the first time period.

81. A method according to claim 80 wherein the entire symbol is the same symbol as the one symbol.

82. A method according to claim 80 wherein the entire symbol is different than the one symbol.

83. A method according to claim 82 wherein the entire symbol and the one symbol are modulated with the same modulation type.

84. A method of changing the gain of a receive path amplifier in a digital receiver that operates upon a received data packet containing first and second pluralities of symbols, the first plurality of the symbols including encoding bits disposed therein and the second plurality of symbols including a first subsequent data symbol encoded in a manner corresponding to the encoding bits, the method comprising the steps of:

locating each of the first plurality of symbols;

decoding the encoding bits within each of the first plurality of symbols;

setting the gain of the receive path amplifier to correspond to an appropriate gain that is determined in part based upon the encoding bits; and

amplifying the second plurality of symbols, including the first subsequent data symbol with the appropriate gain.

85. The method according to claim 84 wherein:

a last symbol of the first plurality of symbols and the first subsequent data symbol are separated by a guard interval; and

the step of setting the gain takes place during the guard interval.

86. The method according to claim 84 further including, prior to the step of locating the one symbol, the step of setting an initial gain based upon at least one power

estimation algorithm applied to a plurality of training symbols within the packet which precede the one symbol.

87. The method according to claim 84 wherein the encoding bits provide data rate information.

88. The method according to claim 84 wherein the encoding bits data provide modulation type information.

89. The method according to claim 84 wherein the encoding bits provide data rate information and modulation type information.